# THE Soybean Digest

AMERICAN SOYBEAN ASSOCIATION
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OF

THE AMERICAN SOYBEAN ASSOCIATION

VOLUME 5 • NUMBER 9 JULY • 1945

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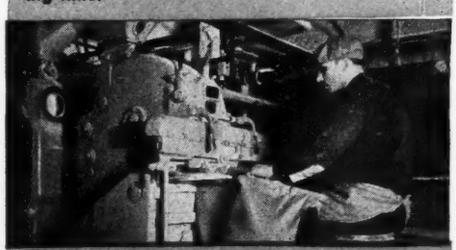

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**The American Soybean Association**

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**Mr. Dodd Evades**

Last month we published on this page a letter by Howard L. Roach, president of the American Soybean Association, to N. E. Dodd, chief of the Agricultural Adjustment Agency at Washington. This month we are able to publish Chief Dodd's answer below.

President Roach expressed the concern of the Association over possible postwar tariff cuts on foreign oils that may compete with domestically produced soybean oil, and inquired the stand of the Triple-A on such cuts.

Mr. Dodd concerns himself in his answer with the need of proper crop rotations after the war, an objective with which no reasonable person can quarrel. But he never once mentions the tariff.

In the meantime there are certain straws in the wind, as reported by our Washington office this month. We are told that the U. S. is trading fuel oil for oilseeds in the Argentine and helping the Philippines get their oil producing facilities in going order again, while at the same time American farmers are being asked to produce oilseeds to the limit. This may be highly necessary in the present emergency, but it leaves a big question mark over the future.

And we are still very much in the dark concerning the stand of Triple-A.

Mr. Dodd's letter follows:

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Adjustment Agency
Washington, D. C.

June 15, 1945

Mr. Howard L. Roach, President
American Soybean Association
Plainfield, Iowa

Dear Mr. Roach:

The acts of Congress under which the program of the Agricultural Adjustment Agency is carried out established a policy providing for: (1) production of adequate supplies of food and fiber crops at fair prices, (2) protection and improvement of farm income, and (3) conservation and improvement of the soil.

Prior to the present war this Agency followed a policy in relation to agricultural production which would result in a sufficient supply to meet domestic needs, probable exports and a reserve to guard against poor crop years.

Since during the war the demand for agricultural products, particularly food, has been unlimited, the facilities of the Agency have been devoted to securing the maximum balanced production from the land, labor, machinery and fertilizer available. Although soil conservation and soil building practices carried out on U. S. farms have reached record levels, we have not maintained our soils.

The increased farm production has been a drain on our soils and many farms have interrupted established rotations to increase such crops as soybeans. As soon as the war emergency is over rotations will again need to be established. Farming practices which will insure maintenance and rebuilding of the soil should be increased.

There is evidence indicating that the present condition of our soil will not permit the continued planting of the large wartime crop acreages if we are to maintain or improve the land. The

conservation and soil building needs point to a requirement for adjustment at the end of the war emergency.

It is believed that, in view of the soil needs, and assuming a reasonably good consumer income, there will be a good market for domestically produced soybean products.

Sincerely yours,
(Signed) N. E. DODD,
Chief.

---

**No Convention in September** For the first time in its 25-year history, the American Soybean Association will hold no convention this September, except through the pages of the *Soybean Digest.*

The decision was reached by the board of directors after it became apparent that there was little likelihood that ODT restrictions on travel will be relaxed in time for the convention. Rather it is expected that congestion of travel facilities may be at its very peak then.

So the Association will round out its quarter century of existence in a very quiet manner, by everybody staying on the job.

But the annual issue of the *Soybean Digest* will make its regular appearance in September. At that time we will bring to you the annual reports of the Association's affairs by its officers, as well as a report on the year's developments in the industry.

Cold print of course cannot take the place of the fellowship of a convention. But we hope to carry to you as complete a report of developments in the world of soy as though a convention were held.

---

**Just in Passing . . .** The article on harvesting by Harry C. Smith tells some interesting history. Soys couldn't become a leading industry until the proper harvesting machinery was developed. How many individuals it takes in different walks of life to build an industry! The farm machinery people are also among our soybean pioneers . . . *Earl Barnes reports on the work they have been doing in Ohio with artificial defoliation. This is a worthwhile experiment. How wide a practical application it has remains to be seen* . . . One year ago the *Soybean Digest* published an article by the managing editor on soybean terminology, in an attempt to end some of the confusion in terms. It scarcely made a ripple. Some of the leaders in the industry still say "bean meal," and spell soybean as two words . . . It has taken the war to bring about a general realization of the value of protein in livestock feeding. This month Lamar Kishlar contributes to the series on livestock feeding by well known authorities . . . *Again we are at a critical juncture with the soybean crop. Last year many soybeans planted for hay matured to be combined. Will we be lucky once more?*

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# 71 WISCONSIN COUNTIES KNOW "SOYBEAN" BRIGGS

AMONG the earliest of soybean enthusiasts is George M. Briggs, agronomist at the University of Wisconsin.

His interest in soybeans began when he was county agent in Burnett County, Wisconsin, 25 or more years ago. He has kept up this interest to such an extent that he is familiarly known as "Soybean" Briggs to farmers throughout Wisconsin and soybean growers everywhere.

When Briggs became an extension specialist at the University of Wisconsin he was asked to continue his soybean work because of the interest he had been taking in the crop while serving as a county agent. From 1920 to 1923 he established soybean plots in 40 counties of Wisconsin — just to familiarize farmers with the crop.

Over the years he has been interested in testing out the various varieties for seed and forage in all the counties of the state and he has about succeeded with that ambition. To do this he has had variety plots in 10 to 15 counties for each of the many years he has been an extension specialist at the university.

While extension workers ordinarily do not feel that they have any official responsibility with breeding programs, Briggs has repeatedly been on committees which have had to do with selection and breeding of soybeans and has had a very definite part in the improvement of varieties that are now standard in Wisconsin. Part of his work has been the evaluation, in cooperation with others, of certain varieties. This work has helped purify and develop seed lots from the varieties that are most desirable for Wisconsin, including Mandarin 507, Manchu 606, Manchu 3, and the improved strain of Mukden.

The Wisconsin crop specialist helped initiate the plan of growing, when other high protein feeds were not readily available, one acre of soybeans for each four head of dairy cattle.

Briggs has been Wisconsin's delegate to national meetings of soybean enthusiasts and helped to organize the American Soybean Association. He was president of the association in 1923, and one of its directors for several years. Two meetings of the association have been held at the University of Wisconsin, one in 1923 and the other in 1940.

Briggs sees soybeans as a pinch-hitter crop when good hay and concentrates are scarce.

# DEFOLIATING SOYBEANS*

## To Facilitate Harvesting

• *Artificial defoliation of soybean plants with cyanamid dust in order to make earlier combining possible has been done successfully at the Ohio Agricultural Experiment Station where the author is associate in agronomy.*

**By EARL E. BARNES**

WHERE soybeans are raised for seed, the combine has proven to be the most popular means of harvesting them. However, if this implement is used, it is necessary in most cases to wait until there is a killing frost before the crop can be harvested. This is necessary so that the leaves will have dried up or fallen from the soybean plants and that any weeds will have dried so they will not interfere with the operation of the combine or with the soybean grain keeping in storage.

This delay in harvesting has two undesirable aspects. First, it usually delays harvest until it is impossible to seed a fall-sown cereal on time. Second, harvesting may be delayed until bad weather sets in; in fact, it may be impossible to harvest the crop at all as happened in many places in the fall of 1942.

If the plants could be killed immediately after maturity, thus making it unnecessary to wait for a frost, harvesting could be advanced materially in many seasons. A recently developed practice of using powdered cyanamid to defoliate cotton before picking suggested this method of defoliating soybean plants. Experiments were started at the Ohio Agricultural Experiment Station in 1943 to determine the rate at which cyanamid dust must be applied to soybeans to defoliate them and also to determine the length of time required after dusting before combining could be started.

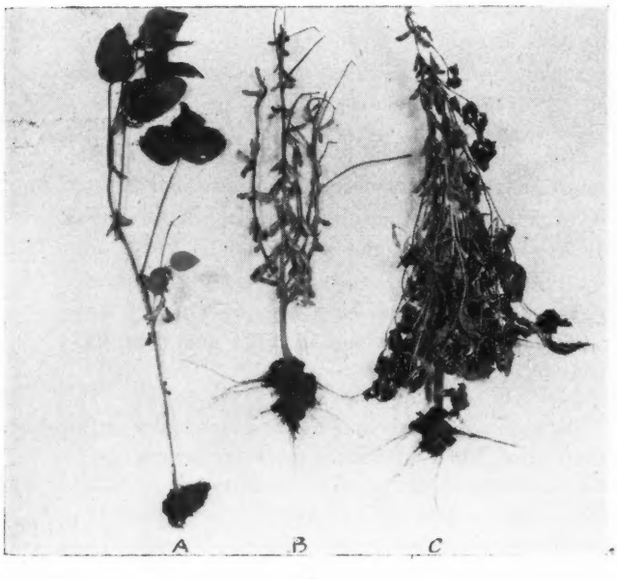
In a preliminary test to determine the rate at which Cyanamid dust would be required to completely defoliate the beans, nine 1/100-acre plots were laid off in a field of Mingo soybeans. Four of these were dusted dry (in the afternoon) and four in the morning when they were wet with dew; one was left undusted. The cyanamid dust was applied with a hand duster. Six days after dusting, defoliation was practically complete on the plots dusted at the 75 and 100-pound-per-acre rates. The results were essentially the same on the plots dusted dry and wet, except that on the plots which were dusted wet it had been impossible to force dust down through the wet foliage to the lower leaves as well. This test was carried out on very immature beans in order to have an indication of the best rate to use later on mature beans. Defoliation of these plants did not kill them, the petioles remained green, and, although at the time of dusting the pods had just formed and the beans had not fully developed, the beans continued to grow and when those on the contiguous undusted plot were ripe and ready to harvest, all the plots (dusted and undusted alike) were harvested and the yields were obtained. Certain analytical data were also obtained on these beans. The results are given in Table 1.

These data show that dusting at this immature stage has cut the yield to less than half that of the undusted beans and it has reduced the percentage of nitrogen (protein), oil, and ash in the dry beans. No difference is shown in the moisture content at harvest. Harvest was delayed long after the dusted beans would have been fit to harvest, since it was impractical to harvest the different plots at different times.

In view of the results obtained from the preliminary experiments, a more extensive experiment was carried out at a later date during the same season on the farm of Paul Schaller at Maumee, Ohio. At the time this

*Approved for publication as a contribution from the Ohio Agricultural Experiment Station.

**A—Leaves not damaged by frost. B—Soybeans dusted with cyanamid defoliant. C—Leaves killed by frost. Location, Maumee, Ohio. Date, fall of 1943.**
—Courtesy of American Cyanamid Co.




**Soybeans on the farm of Paul Schaller, Maumee, Ohio. A—Dusted at the rate of 100 pounds per acre. B—Dusted at rate of 150 pounds per acre. C—Dusted at rate of 75 pounds per acre. Dusting done Sept. 15, 1943, and photographs taken Oct. 19.**
—Courtesy of American Cyanamid Co.

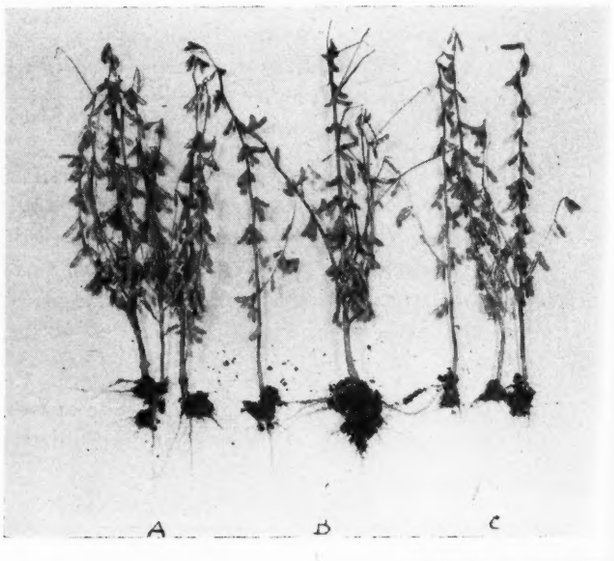


TABLE 1. Analytical data and yields of soybeans from plots dusted very early as compared with the undusted plots.

| Variety | Rate dusted Lb./Acre | Date of dusting | Moisture at harvest | Acre yield Bu. | Wt. of 200 beans Grams | N | % on dry basis Oil | Ash |
|---|---|---|---|---|---|---|---|---|
| Mingo | 100 | 8-17-43 | 13.0 | 9.5 | 24.9 | 6.3 | 18.07 | 4.6 |
| Mingo | 0 | | 13.0 | 23.6 | 33.2 | 6.75 | 18.67 | 5.43 |

TABLE 2. Analytical data on soybeans dusted at maturity.

| Variety | Rate of dusting Pounds per acre | Weight of 200 beans Grams | % content on dry basis Nitrogen | Oil | Ash |
|---|---|---|---|---|---|
| Richland | 140 | 27.1 | 5.00 | 21.78 | 5.59 |
| Richland | 80 | 28.9 | 5.27 | 20.62 | 5.48 |
| Richland | 0 | 27.5 | 5.06 | 22.16 | 6.00 |

TABLE 3. Analytical data on soybeans dusted just before maturity.

| Rate of dusting Pounds per acre | W. of 200 beans Grams | % content on dry basis Nitrogen | Oil | Ash |
|---|---|---|---|---|
| 150 | 30.3 | 6.2 | 19.03 | 5.1 |
| 100 | 30.06 | 6.6 | 16.65 | 5.1 |
| 80 | 33.0 | 6.2 | 17.38 | 4.9 |
| 80 | 35.6 | 6.2 | 17.63 | 4.9 |
| 0 | 34.0 | 6.1 | 19.70 | 5.1 |

dusting was done, Mr. Schaller had beans at two different stages of maturity. The variety was Richland. On one field the beans were at the degree of maturity where more than half of them had turned white; whereas on the other field the beans had been planted later and were less mature. On the latter field the stand was irregular, and no attempt was made to estimate the yield. Rates of cyanamid as low as 40 pounds per acre and as high as 250 pounds per acre were used in this experiment. It was planned to dust one field in the afternoon when the foliage was dry and the other the following morning when it would be wet with dew. The field of more mature beans was dusted on September 15, 1943, and the other the following morning. However, on the morning of the 16th, there was practically no dew, hence both fields were really dusted when the foliage was dry.

### *RATES OF APPLICATION*

As was the case where the beans were dusted in an immature state, the leaves were all killed within one week. Where the rate was 75 to 150 pounds per acre the leaves all dropped off. At rates as high as 250 pounds per acre the leaves were all dead and dried up, but they were still clinging to the plants. It has been noted that this same thing occurs when dusting cotton. Apparently, when very heavy rates are used, the leaves are killed so quickly that the plant does not form an abscission layer and the leaves are "frozen" on the plants. Here again, 75 to 100 pounds per acre seemed to be the most satisfactory amount for removing the leaves.

On the more mature field, which had a uniform stand, Mr. Schaller took some pains, when he combined, to estimate the yield on dusted plots as compared with those not dusted. The beans were not weighed, but he took note of how high they accumulated in the combine hopper from ½ acre and could see no difference in the yield on the dusted and undusted plots.

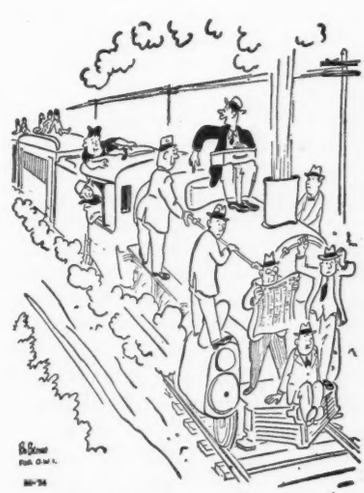
Samples of beans from the mature field were saved and the results from laboratory studies are given in Table 2.

An examination of these data will show that there is no important difference in the weight of 200 beans. The nitrogen content (protein) has not been lowered, as was the case when the beans were dusted in an immature state; on the other hand, the oil content and ash appear to be slightly lower on the dusted beans.

Samples of beans from the less mature field were analyzed and the results are given in Table 3.

An examination of these data will show little effect on the ash content or on the percentage of nitrogen in the beans. It appears however, that the oil content has been lowered about two percent by dusting.

There is another feature that may prove to be of importance in this connection. It has been known for several years that wheat following soybeans usually yielded less than wheat following oats other conditions being the same. This seems to be due to less nitrogen being available to the wheat plants on the soybean stubble. The difference is much greater between the wheat yield on soybean and oats stubble when the beans are combined and the haulm is left on the field than when they are harvested with a binder and haulm is not returned to the field. This indicates that the soybean haulm is low in nitrogen and that when it decays it ties up



"Right up here, Gertrude. I have a seat!"

TABLE 4.

| | Moisture content of beans Sept. 29 % | Oct. 6 % | Oct. 13 % |
|---|---|---|---|
| Not dusted | 46.9 | 31.2 | 20.6 |
| Dusted Sept. 11—100 lbs./A. | 23.2 | 17.9 | 14.3 |
| Dusted Sept. 22—100 lbs./A. | 30.1 | 19.0 | 15.0 |

TABLE 5.

| Treatment | Wt. of 200 beans Grams | Nitrogen percent | Oil percent | Yield per A. Bushels |
|---|---|---|---|---|
| Not dusted | 34.48 | 6.4 | 18.48 | 16.80 |
| Dusted Sept. 11 | 28.11 | 6.8 | 17.66 | 13.96 |
| Dusted Sept. 22 | 33.83 | 6.7 | 18.80 | 15.79 |

nitrogen in the soil in the bodies of the bacteria causing the decay, at a time when the wheat plants needed it. Analysis of soybean haulm supports this view as it runs only about 0.9 percent nitrogen. It is known that, when organic residues containing less than 2 percent nitrogen, on the dry matter basis, are incorporated in the soil, the amount of available nitrogen in the soil is greatly reduced until the organic matter is rotted and the bacteria causing the decay die and disintegrate. It seems logical therefore that the cyanamid applied as a dust to defoliate the plants might be effective in nullifying this depressing effect. In order to get some clue as to whether this might be expected, leaves which had fallen off the dusted and undusted soybean plants were gathered from the ground in the Wooster pilot experiment a month after dusting and the nitrogen content determined in the laboratory. The results are shown below:

| Sample | Percent Nitrogen on dry basis |
|---|---|
| Dusted dry | 1.93 |
| Dusted wet | 2.28 |
| Not dusted | 1.51 |

Following the dusting experiments on Mr. Schaller's farm at Maumee in 1943, the land was planted to corn the following spring (1944). Three plots were laid off to measure the residual effect on the corn yield of the cyanamid dust on the beans the previous year. All three plots received 200 pounds per acre of 3-18-9 fertilizer, plowed under. One of the plots received in addition 200 pounds of granular Areo Cyanamid plowed under; a second plot was on land on which the soybeans had been dusted the previous year with 100 pounds of Aero Defoliant. The third plot received no treatment other than the basic treatment of 3-18-9. The results in the 1944 corn crop were as follows:

| Fertilizer plowed under | Yield of corn per A. Lb. |
|---|---|
| 200 lb. 3-18-9 | 4980 |
| 200 lb. 3-18-9 plus 200 lb. granular cyanamid | 6040 |
| 200 lb. 3-18-9 plus 100 lb. Aero Defoliant, applied to the soybeans the previous year | 5240 |

In 1944 further experiments were carried out at the Ohio Experiment Station at Wooster. In all, 18 experimental plots were used, but in this report only three of these

will be discussed. The beans were planted late, and on September 11, the pods were well filled but the beans inside were still green. One plot was dusted on this date. Eleven days later half of the beans in the pods of undusted plants had lost their chlorophyl and had turned yellow. Another plot was dusted at this time and 48 hours later a heavy frost killed all the leaves. Starting one week after the last date of dusting, samples of beans were taken from each of these two dusted plots and from a plot of beans not dusted and moisture in the beans was determined. This was done again twice more at weekly intervals. Table 4 gives the results of these moisture determinations.

These data show that when the beans were dusted on September 22, only two days before they were frozen, they dried out faster than those frozen without being previously dusted, although the leaves fell off those that were not dusted as soon as from those which were dusted. This indicates that the dusting had done something to the plants which caused them to dry out faster, even though frost killed the undusted beans at the same time as those that were dusted. A greenhouse experiment is being conducted at this time to investigate this feature further.

The yield per acre and further laboratory investigation made on the 1944 crop are shown in Table 5.

These data show that neither the yield nor the oil content were affected when the beans were dusted in their more mature state. When dusted 11 days earlier, the size of beans was reduced and the yield reduced proportionately.

Defoliation of soybeans before combining is still in the experimental stage, but the following facts seem to be established:

1. *Soybeans can be completely defoliated in a week's time by dusting with 75 to 100 pounds of Cyanamid dust, known commercially as "Aero Defoliant."*
2. *When double this quantity is used, the leaves are killed but they continue to cling to the plants.*
3. *The germination of beans harvested from defoliated plants is not injured.*
4. *Dusting at immature stages lowers the oil content slightly.*
5. *Defoliation tends to reduce the ash content of the beans.*
6. *Aero Defoliant is effective in killing most weeds which are common in soybean fields. Smart weed was the least affected of any of the weeds noted.*

—s b d—

"Let's Go Visiting" is the name of the new Wayne Feed radio show which went on the air July 3. The new show marks Allied Mills sixth consecutive year of radio advertising.

**Floodlights engulf the work deck of the new million bushel soybean storage elevator being built by Pillsbury Mills in Clinton, Iowa. Here the night-trick shift of 120 high school football players from the Clinton area continues the round-the-clock concrete pouring job. The elevator, consisting of 44 tanks, each 120 feet high, will be completed in about two months.**

# Pillsbury Elevator

## IS BUILT BY FOOTBALL PLAYERS

The new million bushel concrete elevator being erected at Clinton, Iowa, by Pillsbury Mills next to the Pillsbury soybean solvent extraction plant will be ready to use in about two months.

Pillsbury started construction of the elevator last fall. After the footings and basement level structure were built a labor shortage bogged down the job and the project was held up until more workmen could be secured.

When the labor shortage situation failed to improve this spring leaders of the city of Clinton, labor, business and education got their heads together. Together they worked out arrangements with 120 football players from four high schools to go to work on the elevator after schools closed for the summer.

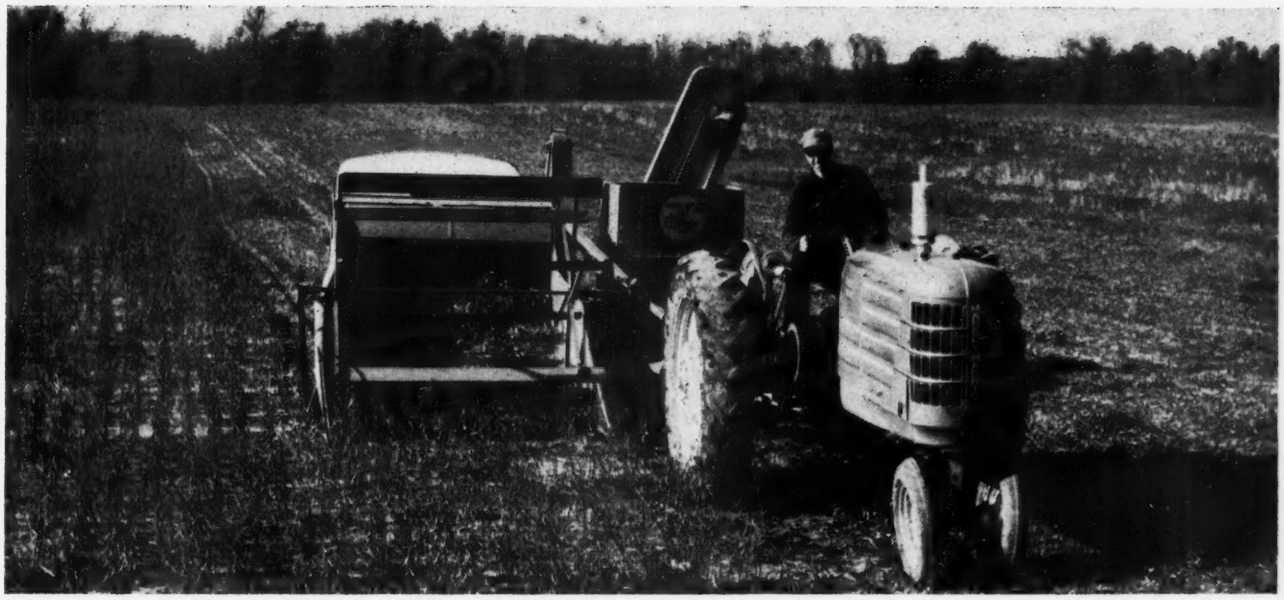
On June 11 the gridders from Clinton, Lyons and St. Mary's schools at Clinton and Fulton high across the Mississippi River in Illinois, began pouring concrete into the silo-like elevator forms. Coaches of the schools are also on the job as supervisors of the youths. It is an around-the-clock operation with the boys working day and night as the concrete must be poured continuously in construction of this type. The elevator will consist of a battery of 44 tanks, or silos, each 120 feet high.

The coaches value the job "as an opportunity for the boys to get in swell condition for the fall football campaign."

A football ceremony was staged the first day the gridders worked and "Ron" Gibbs, manager of Pillsbury's mill at Springfield, Ill., and a nationally known football referee, tooted the starting whistle. At noon officials of Pillsbury Soy division and Feed Mill at Clinton and from the general headquarters in Minneapolis were hosts at a luncheon at the Lafayette hotel to honor the people who aided in getting the elevator construction resumed. Present were Clinton labor, civic and business leaders and the high school coaches.

—s b d—

**Here farmers are hauling bagged soybeans to a Henderson, Ky., warehouse.**
—Bemis Bro. Bag Co.



**Six-foot clipper type combine harvesting soybeans.**

# *21 Years of* SOYBEAN HARVESTING

**By HARRY C. SMITH**
Racine, Wisconsin

• *Mr. Smith, who is service manager of the Massey-Harris Co., gives an account of some of the pioneer work with soybean harvesting. The large industry of today waited on the development of practical harvesting equipment for soybeans.*

THE GROWING of soybeans as a major grain producing crop did not become of importance until about 1924. It was first grown in America as a forage or hay crop and a soil builder. Many, at that time, knew of the varied possibilities the soybean possessed as a grain crop but because there was no suitable equipment to harvest such a crop of ripened grain, its field was limited.

The same equipment that planted and harvested the yearly wheat crop was used to harvest the beans, namely, the grain drill, the grain binder and stationary thresher.

The soybean, when grown to maturity and ripened, shatters out of the pod quite easily. Consequently, the grain binder caused quite a loss in cutting and binding the crop. Also, the soybean kernel cracks or breaks quite easily, and the stationary grain thresher damaged too great a percentage of beans in threshing what was left of the crop after the binder and attendant handlings had taken their toll of losses. These losses plus the costs of seeding and cultivating — plus the absence of a visible market for soybeans as a product — stifled anyone's enthusiasm for growing the crop extensively.

Gene Staley, founder of The Staley Co. of Decatur, Ill., and Garwood Brothers, Stonington, Ill., the former a processor and the latter producers; partly through environment and partly through faith and vision might well be given credit for creating the impetus that started the phenomenal growth of the soybean industry. There were others before these but space does not permit recounting them here since this story deals primarily with the development of soybean harvesting machinery.

It was the Garwood Brothers who first showed the world that soybeans could be grown without excessive crop losses or without exhorbitant hand labor costs. The displacing of the horse with trucks and motor cars had cut deep inroads in the oats market. Visualizing the necessity for another farm crop to take the place of this loss of a market for their oat crop, the Garwoods turned to soybeans and a study of the attending problems. Their study of the harvesting problem took them to the makers of the combined wheat harvesters that had already proven successful in wheat growing areas.

Here, the Garwoods were rebuffed with the usual barrier that confounds every new enterprise. They visited two prominent manufacturers of combine-harvesters and were told that it was neither practicable nor possible to try to harvest a crop of ripe soybeans with a "wheat machine." This, however, did not stop them. They next visited the Massey-Harris Harvester Co. Here their story was greeted with a note of optimism. An agreement was eventually made whereby a Massey-Harris Reaper Thresher built to cut a 12-foot swath would be sent to the Garwood farms and tried out in a field of ripened beans at no cost to them if the machine's operations proved unsuccessful. After some changes and alterations had been made by the Massey-Harris engineers, the reaper thresher was accepted by the Garwood Brothers as a successful and economical harvester of ripe soybeans.

### *THE CUT IN MAN-HOURS*

Before the advent of this equipment (1924) 13 man-hours, 29 horse-hours and three-quarters of a tractor hour were required to grow and harvest 1 acre of soybeans. Now an acre can be grown and harvested with 3.7 man-hours and 2.1 tractor hours. The horse has practically disappeared from this field of activity.

After these pioneers had proved to the world that the soybean possessed many possibilities, "Those who came to scoff remained to pray," and almost overnight there began an intensive program of development. That area surrounding Decatur, Ill., became the center of activities at-

tending the development of the industry. Engineers representing the various farm implement manufacturers became almost a common sight in this area, seeking to develop their machines into satisfactory equipment for tilling and harvesting soybeans.

Professor J. C. Hackleman aided by Dr. W. L. Burlison of the University of Illinois, sensing the vast future of the soybean, began breeding types and varieties. Through selection and hybridization there soon developed plant species far superior both in adaptability and productivity to that grown and harvested on the Garwood farms in that history making season of 1924.

During those first few years, a yield of 20 bushels per acre was considered quite prolific. Now yields of 40 bushels per acre are not too uncommon.

*CHANGE IN EQUIPMENT*

Through this change of plant growth it became necessary to make changes in the harvesting equipment to handle the new and heavier varieties. The increase in yield came from increased size in plant stalks, taller and of heavier structure. This heavier plant growth sometimes completely covered the ground with a veritable mat. The cutter bar of that first combine was not designed to cut through and deliver to the threshing mechanism such an interwoven mass of stems. Such a covering over the ground prevented the ground from readily drying after rainfall. This necessitated a machine of lighter weight so that fields could be travelled over without sinking deeply into the muddy surface. Also the matted tangled growth tended to resist any narrow passages or change of direction of conveyance. The development of a combine that would cut through thick foliage, close to the ground and convey the stalks straight back from the cutter bar without twisting or turning became almost a "must" in machine design.

With this type of cutter bar and table as a beginning, it became a "natural" to build a combine with a wide threshing cylinder and separating body to thresh or hull the beans from the pod and separate them from the plant-straw, thereby eliminating bottle necks and abrupt turns. The result was a combine tailor-made for handling soybeans, the straight through "clipper-type" combine with a scoop cutter bar and table cutting a 5- to 6-foot swath; driven with a power take-off shaft from the tractor to still further reduce machine weight and production cost. In short order, the "Scoop type" combine became the most popular soybean harvester.

True to the traditions of American ingenuity, this peak of efficiency bids fair to be superseded by a still more efficient type of combine, a development pioneered by the Massey-Harris Co. This new machine is complete within itself, being self powered or "self-propelled," thus eliminating the need for a tractor to power and propel the combine. Although this reduction in required equipment is of major importance, it is not the most important improvement embodied. This self-propelled combine is capable of traveling over more difficult ground and muddier fields showing far less inclination to bog down in soft going. Besides these features the cutter bar embraces the full width across the frontal area of the machine, thus like a lawn mower, it cuts everything before it. Tractor drawn combines are forced to trample down a part of the crop in making the first cut around a field. Soybeans are very easily shattered from the stalk and practically all the beans are lost from the plants that the tractor and combine have travelled over. It is conservatively estimated that this loss will add up to a minimum average of ½ bushel per acre for the whole field.

Another valuable feature is that the machine is not confined to follow each succeeding swath but may travel out into the standing crop at will. If there happens to be a green spot in the field that should be left to ripen more, the self-propelled combine can detour around this spot without trampling down still more beans.

The capacity of any combine is measured by tons of material handled per hour and not by miles per hour travel. Therefore, the speed in miles per hour travelled by a combine should be regulated to match the density of the crop being cut. This new combine is equipped with variable speed traction drive so designed that the speed in miles per can be varied at the will of the operator at any speed between ¾ and 3 miles per hour, or 2 to 8 miles per hour without stopping to shift transmission gears or without changing engine speed. This makes it possible for the operator to increase travel speed in spots where the crop is light and to decrease speed where the crop is heavy without the loss of time required to stop and shift transmission gears that have only one, two, or more selections of fixed speeds.

These transitions both in improved type of soybean varieties and harvesting equipment have played their part in elevating the soybean crop from an obscure acreage in 1924 of 448,000 yielding 11 bushels per acre to a grand total of 10,800,000 acres yielding 18.1 bushels per acre in 1943. An increase of approximately 2,400 percent in 20 years.

# PROTEIN HUNGER *Must Be Met*

**By LAMAR KISHLAR**
Member Soybean Research Council

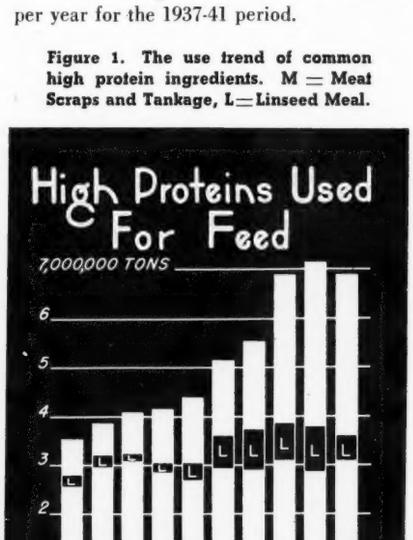
• *This article is second of a series of eight by well-known nutrition authorities on feeding livestock and poultry.*

THE high producing herds and flocks on the more efficient farms of our bountiful America are the best fed in the world. It is, however, quite a different story for the average farm animal and fowl. There always has been "protein hunger" among the common flocks and herds in this country. Our nation can double the use of concentrates before the saturation point is reached. If all the birds and farm animals could be fed a well-balanced diet the efficiency of producing beef, pork, milk and eggs would be stepped up many fold.

It is generally agreed that for efficient production of meat, milk and eggs, high protein concentrates should be fed with carbohydrate feeds in the ratio of about 1 to 6.

On the basis of the prewar average years of 1937-41, the four principal feed grains, corn, oats, barley and grain sorghums totaled 85.1 million tons fed. Other feed grains amounted to 4.5 million tons while grain by-products will add another 8.5 million tons. Thus, the quantity of all carbohydrate feeds fed averaged about 98.1 million tons per year for the 1937-41 period.

**Figure 1. The use trend of common high protein ingredients. M = Meat Scraps and Tankage, L=Linseed Meal.**



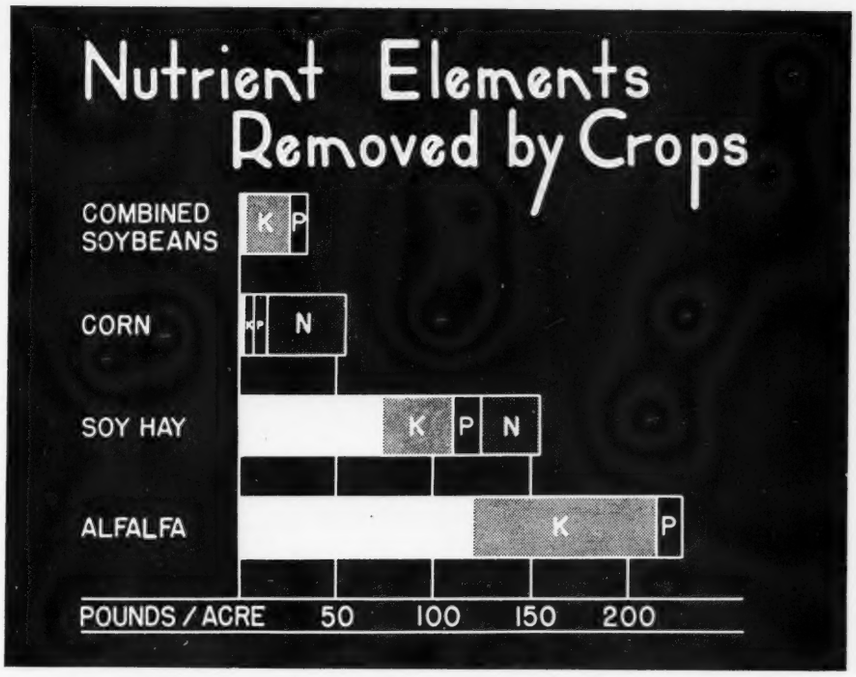



**Figure 2. Soybeans remove less phosphorus, potassium and calcium from the soil than other common crops.**

At a ratio of 1 to 6, it would require about 16.3 million tons of high protein feeds (oil meal equivalent) to adequately balance the carbohydrate feed available for efficient livestock and poultry production.

However, supplies of high protein concentrates for this period averaged only 7.7 million tons (oil meal equivalent) which is 8.6 million tons less than the optimum requirement, or on an average, only one-half enough to do the best job. America has always been protein short, but it took a war to wake up the average feeder.

During the war years, soybean oil meal was called upon to carry the extra demands for protein caused by the emergency. It was most fortunate that the soybean had secured a firm position in the domestic economy before war clouds appeared and that its production had grown from a mere five million bushels in 1924 to 107 million bushels in 1941. Later crops run up to a 200 million bushel figure.

The estimated use for feed of animal proteins (see FIGURE 1), such as meat scrap, tankage, fish meal, and milk by-products, has remained almost constant for the past decade. The use trend of cottonseed meal also has remained nearly constant for the last 10 years. Only soybean oil meal and linseed oil meal have shown tremendous gains in production and consumption. It was soybean oil meal which took up the shock and supplied the increased protein demands caused by a global war. The minor oil meals including linseed meal, peanut meal and copra meal about doubled in consumption but because of their relatively small volume added only modestly to the total tonnage of protein concentrates used.

In spite of a five-fold increase in 10 years, soybean oil meal still fails to supply the demand for proteins. A five hundred percent increase in soybean oil meal caused less than a one hundred percent increase in the total of high protein feed. But even a one hundred percent increase in the use of high protein feedstuffs fails to supply the war time demand or even balance the carbohydrate feeds which will be normally used in peace times.

The reason for this can easily be seen from the record. On the basis of the October 1, 1944 Crop Report supplies of the four principal feed grains total about 131 million tons which is about two million tons less than the year before. Other feed grains will amount to only 8.2 million tons, a drop of 7.5 million, while grain by-product feeds may add 6.0 million tons. Thus, the supplies of all carbohydrate feeds may be about 144.7 million tons in the 1944-45 season.

At the 1-6 ratio, it will require 24 million tons of high protein feeds (oil meal equivalent) to adequately balance and give efficient livestock and poultry production. Only about 7.5 million tons of oil meals and animal proteins (oil meal equivalent basis) are available. American livestock and poultry never have been adequately fed and much grain was always wasted. When periods of emergency appear and more feeders practice better feeding, the shortage of proteins shows up and a scramble for the limited supplies occurs. We produce too little protein feed in proportion to carbohydrate feed for a balanced feeding program.

In the postwar world it is the soybean which must continue to make up the need for protein. The production of animal proteins is limited by the livestock slaughtered and these will diminish when war time needs fall off. The production of fish proteins is limited by restrictions of weather and available fish. The amount of fish proteins has remained static for a decade. The available cottonseed meal is slowly diminishing as the production of cotton is curtailed. Peanut crushing and linseed crushing gained under the stimulation of war but in comparison with other protein concentrates their volumes do not greatly influence the total proteins available. It is the soybean which must carry the load of the peace time protein demand. In our postwar period, more soybeans and less carbohydrate feeds will give us a better feeding economy.

Not only is the soybean capable of filling the postwar need for protein but it is also qualified to help maintain the nutrient elements in our soil. The soybean, a legume, takes nitrogen from the air and deposits it in soil. At the same time, the soybean removes less phosphorus, potassium and calcium from the soil than corn, alfalfa or other crops commonly grown. (FIGURE 2).

In animal nutrition we usually think of soybean proteins only as sources of amino acids for tissue building, overlooking the fact that the protein molecules also contain carbohydrate radicles which can serve as sources of energy just as efficiently as like amounts of carbohydrates from cereal grains or other sources. In practical feeding, it is better to supply a little excess protein rather than too little since excess can be eliminated from the animal body in the form of simple nitrogen compounds while a deficiency cannot be made good through conversion of carbohydrates into proteins.

Because of the rapid advances being made by the agronomist, the soybean technologist, the soybean processor and the biological chemist of today, American agriculture tomorrow will be on a far more efficient and balanced basis which not only will conserve the soil but also will help produce better and less expensive meat, milk and eggs. In the postwar world, as in a world at war, it is the age-old soybean which will lead to a better way.

—s b d—

## PREDICT IOWA CROP DECREASE

A probable postwar decrease of four million acres in intertilled crops in Iowa is forecast by A. J. Englehorn and A. C. Bunce in Iowa State College Research Bulletin 324, "Adjusting Crop Acreages for War Production to the Soil Resources of Iowa."

Such a decrease in intertilled crops would be coupled with an increase of small grains by about two million acres and an equal amount of hay and pasture crops.

"In percentage these figures indicate a reduction of about 35 percent in intertilled crops, an increase of about 40 percent in small grains and an increase of about 25 percent in all hay and pasture. These changes will have repercussion upon the livestock system and will mean adjustments in the numbers of hogs and cattle."

By the authors' estimate Iowa farmers have increased their acreage of intertilled crops by almost three million acres from 1941 to 1943.

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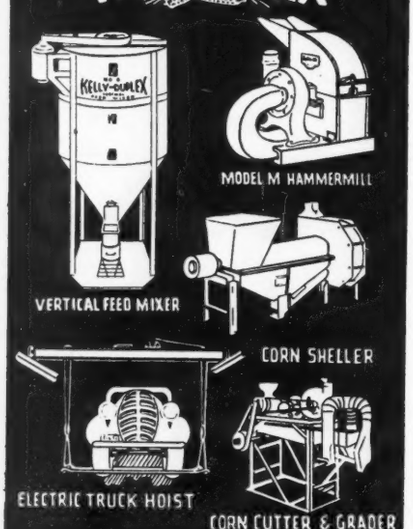


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# ★ BOOKS ★

## "THE USEFUL SOYBEAN" . . .
## Health Stores Introduced It to the Public

THE USEFUL SOYBEAN, A PLUS FACTOR IN MODERN LIVING, by Mildred Lager, 284 pages. Price $2.75. McGraw-Hill Book Co., Inc., New York.

This readable volume containing 350 recipes is far more than another cookbook. It gives a history of the soybean industry and a good survey of soybean usage, both food and non-food.

The author conducts a health food store in Hollywood, has had her own program on the air, is past president of the Health Food Dealers of Southern California and past vice president of the National Dietary Association. The book covers diets for diabetics, allergics and other specialized diets. There is a good account of products such as tofu, milks, butters, etc., as well as the items of broader usage such as soybean oil, soy flour and grits.

The author, who says that soybeans originally were "thrust upon" her, has her own dietary philosophy. She gives little comfort to a public currently trying to solve all dietary problems by taking a few food pills daily. She says, "Synthetic vitamins and minerals will never equal the intricate combinations of natural foods . . . We must go back to the use of more natural, unrefined foods with their known and unknown vitamins. We must replenish our soils and strive to produce foods that contain what nature intended them to contain."

The book pays tribute to the role of the health food store and small food manufacturer in introducing soy foods to the American public, a role that has been all too little appreciated. "The little food manufacturer has been a true pioneer in his work on soybeans . . . In his experiments as a pioneer, often he did not know how to use the bean and literally stumbled along in its manufacture. It is no wonder that his first products were often unscientifically prepared and lacked uniformity as well as palate-tickling qualities. In spite of ridicule, hard work, sales resistance, and little demand, the soy manufacturer has blazed new trails and gradually conquered new territories . . . Today's successes are built upon the struggles of the pioneers of the past."

*DOWN*
*KITCHEN DRAIN*

Of her own efforts, the author writes, "I have worked with doctors, nutritionists, and dieticians who wanted to experiment with soy or who wanted soy products for their patients. Sometimes securing the products was not an easy task. When I did get them, I had to make up recipes. To be sure, I must admit that many of these concoctions eventually found their way down the kitchen drain . . . The first soy flour was gritty; the hulls had not been removed; it was bitter and beany in taste. Bakers experimented with soy bread, and no two batches turned out the same. Canned soy milk was an unheard-of product. When it did appear, it was far from perfect. Nevertheless, milk-allergy babies thrived on it . . . Every soy pioneer can tell the same story, be he plant scientist, grower, processor, food manufacturer, or even consumer; we were all lumped into the same class, 'fanatics'."

A section is devoted to restrictive governmental regulations of soy products which include margarine and soy milk, and soy flour in baked products, ice cream and sausage meats. The author makes an interesting comparison between the attitude of our government on this subject, and the governments of Great Britain and Canada, which welcome the addition of soy flour in bakery goods to raise nutritional value. In this country the present main reliance is on synthetic vitamins for food enrichment. Can-

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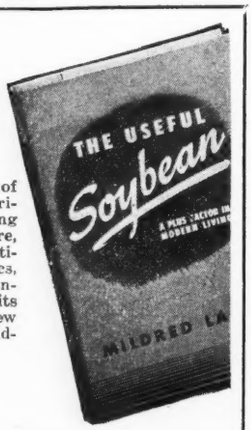


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ada actually classes these products as adulterants.

A short section on terminology is somewhat confusing. The author frequently uses "meal," a word which devils the industry since it may be used to refer to more than one product. Her use of "soy feeds" may bother the trade.

The author does a good job of citing references and authorities, which will make the book helpful to the student who wishes to pursue the subject further. Files of the *Soybean Digest* and U. S. Department of Agriculture and university publications were heavily drawn upon.

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THE CHEMICAL FORMULARY, Vol. VII. Harry Bennett, Editor. The Chemical Publishing Co. of Brooklyn, N. Y. 474 pages. Price $6.00.

Amateur and professional farmers, just plain gardeners, in fact anyone who deals in or enjoys growing things will find much of utility and interest in the recently published Vol. VII of The Chemical Formulary. Behind this imposing title there are 2,500 formulas for making almost anything easily, quickly and inexpensively at home. The first general publication of directions for making up the famous DDT insecticides is only one of its many aids to gardeners and farmers. Full directions for making almost any other mixture needed for garden, home and livestock care are included.

Numerous formulas employing soybean oil, lecithin and soy flour as well as recipes for stock feed including soybean oil meal are included, but since these items are not indexed they are not readily located.

—s b d—

## BEES OFFER SOY MARKET

Beekeepers offer one of the newer markets for soy flour, now being used extensively as an ingredient in pollen supplements for bee feeding.

Pollen is the high-protein food which bees normally use for brood rearing. They gather it from flowers and store it in the hives. Supplies are apt to be low in the spring months, and it is at this time that the supplementary feeding is done.

Experimental feeding of bees with soy flour in pollen supplements has been carried on by the U. S. Bee Culture Laboratories at Madison, Wis., the division of entimology at the University Farm, St. Paul, Minn., and the Dominion Experiment Farm at Ottawa, Canada.

Some 25 different foods were tested at St. Paul, with combinations of soy flour and dried brewers' yeast or dry skim milk proving the most satisfactory. Expeller processed flour with a 5 to 7 percent fat content is recommended. An article by Mykola H. Haydak describing the work at St. Paul was published in the April issue of *American Bee Journal.*

That bees have a liking for soy flour is reported by L. F. Childers in *American Bee Journal.* He writes:

"There is something about dry soy flour that makes bees crazy for it. If you are one of those who wake up in the morning with a dark brown taste in your mouth and you are all fussy and want to kick the dog around, let me suggest you get a pasteboard box two feet square for 40 or 50 hives, cut it down to about four inches deep and place two or three inches of soybean flour in it. Take it to the apiary on the first sunny day of spring, place it in the open where the sun beats down and out of the wind, and hang around a bit.

"Within a half hour the bees will be out there eating and filling their pollen baskets, scrambling around. It is downright amusing and it won't be long before your face will crack into a smile that will get bigger as you find yourself leaning up against a tree laughing all the slats loose in your old rusty hide. It is good for the bees and good for the blues. Let me dare you to try it. If the bees don't perform, I will buy Joe Stalin a brand new corncob pipe."


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# National Acreage Is Down 2 Percent

The July report of the U. S. Crop Reporting Board places the 1945 national soybean acreage at 13,283,000 acres grown alone for all purposes. This is 2 percent under the 1944 crop but 46 percent larger than the 10 year national average.

The Board estimates 10,392,000 acres for harvest, 1 percent below last year. About the same acreage as last year is indicated for Cornbelt states, which produce about 90 percent of the harvested crop.

First official forecast of 1945 production will be made August 10.

Indicated acreage for 17 principal soybean producing states is as follows: Pennsylvania, 92,000; Ohio, 1,321,000; Indiana, 705,000; Illinois, 4,050,000; Michigan, 140,000; Wisconsin, 92,000; Minnesota, 646,000; Iowa, 1,984,000; Missouri, 862,000; Kansas, 298,000; Virginia, 194,000; North Carolina, 325,000; Kentucky, 175,000; Tennessee, 223,000; Alabama, 244,000; Mississippi, 263,000, and Arkansas, 375,000.

Correspondents report that flood conditions in southern Illinois and parts of Indiana, Missouri and Kansas have so delayed planting or replanting that maturity of the crop is questionable in those sections.

July 1 reports of *Soybean Digest* crop correspondents follow:

ARKANSAS

*Tildon Easley, extension agronomist, Little Rock:* All plantings late. Due to extremely wet weather in early spring practically no soybeans were planted early. During last two weeks in May and first week of June favorable weather allowed a good percentage of crop to be planted. But following week extremely heavy rains resulted in some bottom lands where beans were planted being flooded again.

CONNECTICUT

*J. S. Owens, professor of agronomy, University of Connecticut, Storrs:* Planting date two to three weeks late. Growth small due to late planting. Continued wet weather has not only delayed planting but has also increased yields of biennial and perennial forage crops so much that soybean plantings will not be greater than 1944 and perhaps smaller. Approximately 100% for hay, pasture or silage.

ILLINOIS

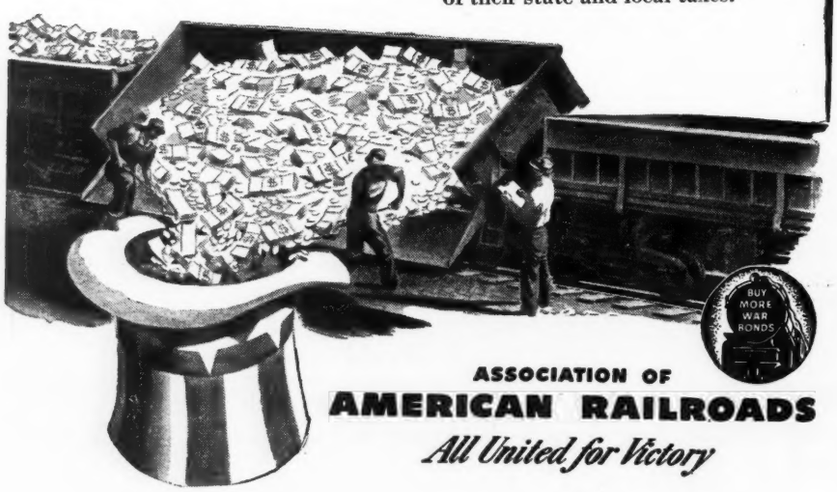
*Frank S. Garwood & Sons, Stonington, for south central:* Planting date 15 to 25 days late. Acreage 120 to 125% of 1944. Maturity and condition 75% normal. Many more acres planted to soybeans than normal. Due to lateness of season many farmers being afraid of chinch bugs reduced corn and increased soybean acreage. Soybeans also gained at expense of oats.

*Russell S. Davis, Clayton, for west central:* Planting date 30 days late. Acreage 75% of 1944. Still a lot to be planted. Condition and maturity 50% normal. Much of what is planted is in water soaked seedbed and weedy. Growth small for age. Considerable corn acreage will probably be replaced with beans.

*A. J. Surratt, agricultural statistician in charge, Springfield:* Illinois soybean planting of an increased acreage started with near timely planting for 60% of the total acreage up to June 5th. The necessity of replanting about a sixth of this due to drowned out lowland and low parts of fields, also from seed rotting in cold wet soils on poorly drained land during the abnormally cold weather of late May and early June reduced the timely planted acreage to about 50%. Cool weather set back growth a week later than usual for this earlier half of the crop. Irregular planting progress followed in northern and northeastern quarter of Illinois with little or no planting possible in southern and west-central sections up to June 22nd. Planting was again resumed June 22nd with the better progress northeastward in the state, but continued to be a slow struggle due to wet weather in the

**BALANCE SHEET**

| *In the other World War* | *In this World War* |
|---|---|
| The railroads, in 1918, performed 405 billion ton-miles of freight service. | The railroads, in 1943, performed 727 billion ton-miles of freight service, 737 billion in 1944. |
| Railroads performed 42 billion miles of passenger service in 1918. | Railroads performed 87 billion miles of passenger service in 1943 and 95 billion in 1944. |
| Freight rates were raised about 25%. | Freight rates remain substantially the same as they were prior to the war. |
| The government took over the operation of the railroads. | The railroads have remained under their own management. |
| Deficits resulting from Federal operation cost the taxpayers 2 million dollars a day. | The railroads are paying Federal taxes at the rate of more than 4 million dollars a day—to say nothing of their state and local taxes. |

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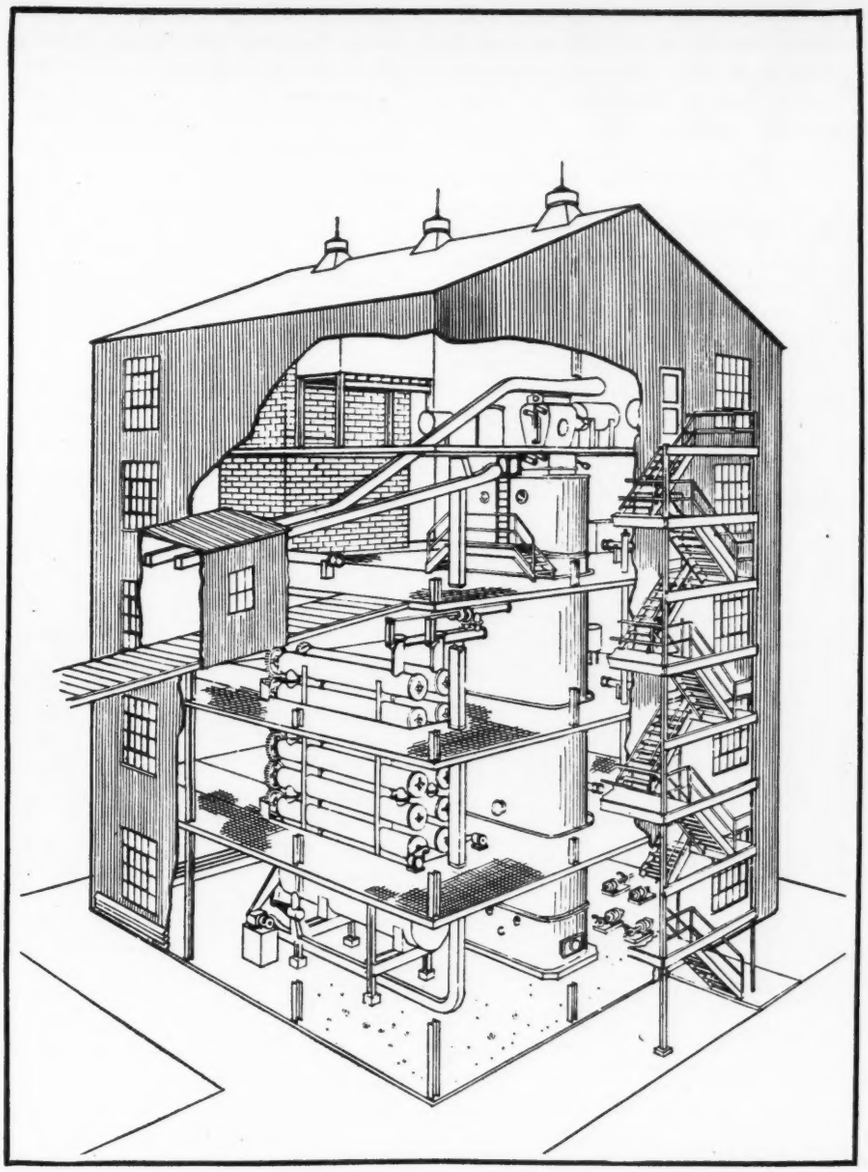

SOLVENT EXTRACTION OF VEGETABLE OILS

# BLAW-KNOX *is READY*

The vegetable oil industry is far from new, but until recently the processes employed were crude and inefficient. Blaw-Knox Engineers were among the first to design and build entirely new equipment, employing radically new methods of operation.

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southern and lower west-central quarters. Planting was about 2/3 completed by June 23rd and 80% by June 30th with the unplanted acreage largely in the southern half where planting will continue until mid-July. In this latter area June rainfall was about double normal and the southern quarter of the state has had one of the wettest and most discouraging seasons ever recorded. Some land will remain idle in that area this year. Fortunately for soybeans, the larger part of the acreage to be harvested for beans is located in the northeast quarter of Illinois where the prospect is well above average. A rather important soybean area in lower east central Illinois is very late, in fact considerable acreage remains to be planted there. Outlook in the main producing area ranges from poor to good and will average fair. Outturn of the very late sown soybeans is problematical.

*Gilbert F. Smith, Newman, for east central:* Planting date two weeks late. Acreage 15% less than 1944. Many acres to be sown. Much water still standing in fields.

*J. E. Johnson, Champaign, for Champaign and adjoining counties:* More early planting than any previous years. Less very late planting than in 1944. Condition and maturity average. Current moisture supply good. Heavy rainfall through April, May and June. Close observing farmer is learning it is profitable to plant beans in advance of corn, especially with coming of corn borer that is here to stay. By so doing he is insured of earlier maturity, and an opportunity to get soybeans to market earlier when weather is favorable. Likewise close observing grower is selecting varieties that fit into greatest efficiency of soybean production. There has been a sound and constructive recommendation not to plant the entire acreage, that is of course unless you have only small acreage, to one variety. More and more you hear farmers saying, "The Lincoln soybean has been oversold," not inferring that it isn't an excellent soybean, but rather it hasn't been tried on a wide enough scale to give full picture. The better method seems to be to fit the variety to the particular farm.

*J. C. Hackleman, professor crops extension, University of Illinois, Urbana:* 6.28 in. rain in 14 of first 18 days in June. Growers planted all Lincolns they could get, then all Richlands and Earlyanas they could get for June and July planting.

INDIANA

*Peter J. Lux, Indiana Agricultural Conservation Committee, Indianapolis:* Planting date week or more behind normal. Acreage about same as 1944 in most areas. Condition at or above normal except for wet spots. Maturity average. Current moisture over supplied in most areas. Southern one-third of state held up due to heavy rain and floods, with sizeable acreage drowned out or planting delayed. Soybeans may still replace corn that was drowned out or not planted in many southern counties. Hay and pasture conditions generally excellent except for rain and flood conditions in certain areas.

*K. E. Beeson, Indiana Corn Growers Association, West Lafayette:* Except in southwestern quarter soys were planted largely during last 10 days of May and early June. Acreage probably slightly less than 1944. Stands seem good but abundance of rainy weather may contribute to weedy and grassy soys. Excessive wet weather in southwest delayed plowing and floods in river bottoms in latter half of June make necessary delays in planting until July. Expected that an extensive acreage of short season soys will be planted. Short acreage of red clover and difficulties of saving first cutting of alfalfa and red clover will contribute to considerable acreage of soys harvested for hay this fall.

*Ersel Walley, Walley Agricultural Service, Ft. Wayne, for northeast Indiana and northwest Ohio:* 95% planted by or before normal season. Acreage about same as 1944. Condition and maturity normal. Some beans (not over 5%) planted in late June on fields where earlier plantings of corn or beans drowned out.

IOWA

*Howard L. Roach, Plainfield, for northeast:* Planting date normal. Acreage 10% less than 1944. Maturity 10 days late. Moisture supply ample. Other legumes good; will not be many beans used for hay.

*O. N. La Follette, Feed Institute of Iowa, Des Moines:* Planting date late, comparable with 1944. Total acreage of state comparable with 1944. Considerable planting of beans in southern and west central Iowa during last week of June. Maturity slightly later than 1944. Cool, wet weather retarded growth of early planting. Amount for hay depends on final conditions this fall.

*Fred Hawthorn, Castana, for western:*


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Beans off to late start. Cold, wet weather not conducive to rapid growth. Stand spotted due to excessive water and mudding in.

KANSAS

*E. A. Cleavinger, extension division Kansas State College, Manhattan, for east:* Beans normally planted by June, 15 but planting not yet completed. Acreage 80% of 1944, but later planting will increase this. Condition 75% due mostly to late seeding.

MICHIGAN

*A. A. Johnson, Michigan State College, East Lansing:* Planting date two to three weeks late. Acreage reduced somewhat by late planting season. Late season created unusual demand for early maturing varieties. Condition and maturity late. Current moisture supply very good.

MINNESOTA

*Farmer Seed & Nursery Co., Faribault, for south central:* Planting date about normal. Acreage about same as 1944. July 1 condition good. Soybeans can take more water than corn. Maturity two weeks late. Most acreage planted for ripe beans. However, due to late, wet season, beans when available put in for hay.

*John W. Evans, Montevideo, for southwest central:* Planting date delayed one week. Acreage about same as 1944. Moisture supply good. 20% for hay.

MISSOURI

*Harry A. Plattner, Malta Bend:* Planting date 15 days late. Excess of moisture during


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Today all Purina is engaged in a "Food for Victory" Crusade . . . a Crusade to help the farmers of America produce efficiently the most meat, milk and eggs from the supplies of feed now available. Purina's five soybean processing plants—every man and every machine—are in this Crusade producing to capacity.

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MEAT
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PURINA CHOWS

FOOD WILL WIN THE WAR AND WRITE THE PEACE!

June. Acreage 25% above 1944. July 1 condition early planted beans good. Seed beans are having demands far above their supply for adapted seed. Rain and cold weather slowed up corn planting.

NORTH DAKOTA

*B. E. Groom, Greater North Dakota Association, Fargo:* We had a very late and unfavorable seeding season. There are fellows still seeding flax here in North Dakota. That $5.00 an acre program for flax just about upset all practical common sense programs for operators. We will have the acres but whether we get flax remains to be seen. In the 45 years I have spent up here I have never seen a first class crop when we did not have some good soaking June rains. We have not had them this year — we have considerable moisture but it has been light showers and spotted. This unfavorable seeding season combined with an acute labor shortage, appeal to grow flax and other things has naturally cut down the soybean program. On a trip that I made this week I noticed a good many fields of soybeans about four inches high.

OHIO

*Ohio State University for western and northwestern:* Planting date about a week late. Acreage perhaps about 10% less than 1944. Maturity a little late due to excessive moisture and cool weather.

*W. G. Weigle, manager Marsh Foundation Farms, Van Wert, Ohio, for northwest:* Average of all planting one week late. Acreage about 5% larger than 1944. Condition 80% due to water damage and weeds. Maturity about week late. Heavy rains throughout territory latter half of June.

WISCONSIN

*John P. Dries, Saukville for southwest:* Planting date 20 days late. Acreage same as 1944. Maturity 20 days late, very slow growth. Current moisture supply poor. Seems to the writer we will have to have a long fall season to mature soybeans in Wisconsin in 1945.

*George Briggs, Agricultural College, Madison:* Planting date normal some areas but 40% of state later than normal. Acreage about same as 1944. Current moisture supply too plentiful.

## PUBLICATIONS

SOYBEANS: CERTAIN AGRONOMIC, PHYSICAL, CHEMICAL, ECONOMIC, AND INDUSTRIAL ASPECTS, by J. H. Shollenberger, Commodity Development Division, and Warren H. Goss, Engineering and Development Division, Northern Regional Research Laboratory, Peoria, Illinois. Mimeographed. 84 pages.

Another of the highly informative pamphlets on soybeans that have been coming from the Northern Regional Research Laboratory with considerable regularity. A good handbook on recent production and usage of the crop, with complete statistics from the U. S. Department of Agriculture and the Bureau of the Census.

There are chapters on the chemical composition, culture, crop disposition and marketing. One value of the publication lies in its detailed statement on utilization of both the oil and oil meal fractions in food and non-food products and livestock feeds, showing volume consumption for each product during recent years.

Of general interest to those engaged in processing or contemplating construction of


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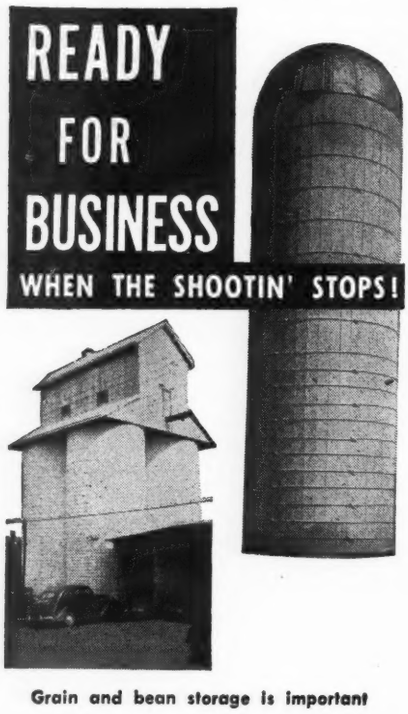

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such plants is the discussion of the economical type, location and size of processing plants. The authors are not too encouraging to the small plant, particularly what they call the "ultra-small installation" which might be set up in a barn or operated to serve a small community. They point out that prior to the time the government assumed control of the processing industry not one such mill had proved itself successful in direct competition with larger mills. "A complete study of operating costs in mills of various sizes reveals that it is much cheaper to crush soybeans in large plants than in small ones," they state . . . "No general statement can be made in regard to the smallest size of soybean mill that is practicable, for the answer to this question varies from location in accordance with many economic factors . . . The one-expeller type of mill has proved perfectly satisfactory in many locations for small-scale operation."

This is a handy reference work. It is our understanding that it will be available for limited distribution later in the summer.

—s b d—

## Market Street

**We invite the readers of THE SOYBEAN DIGEST to use "MARKET STREET" for their classified advertising. If you have processing machinery, laboratory equipment, soybean seed, or other items of interest to the industry, advertise them here.**

**Rate: 5c per word per issue. Minimum insertion $1.00.**

FOR SALE — Used Steel Storage Tanks, 8,000, 10,000, 12,000, 18,000 gal. and other sizes. Stanhope, Rosemont, Penna.

UNIVERSAL 8 pc. Tool Set, $14.85—10 pc., $19.85; Wrench Set, 6 pc. box end, $7.85—Open end, $9.85; Combination Box and Open 8-wrench set, $14.95; Midget 1/4" or 3/8" Socket Set in case, $19.85; Standard 1/2" 15-pc. Socket Set & Case, $29.85; Tractor 3/4" 14-pc. Socket Set & Case, $49.85. Immediate shipment. Clip ad. Mail check now! Universal Tool Co., 1527 Grand, SBD9, Kansas City, Mo.

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Every mixed feed manufacturer (or feeder), knows that Swift's Soybean Oil Meal is a quality protein base for livestock and poultry feeds. It will help you balance your analysis economically. And it adds extra palatability plus important nutrients.

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Des Moines, Iowa Fostoria, Ohio Blytheville, Arkansas

# GRITS and FLAKES...

## FROM THE WORLD OF SOY

"Along the Line in New York and Pennsylvania" is the last in a series of booklets by the Nickel Plate Road. There is little soybean lore in this book but the location of the two processing plants at Buffalo is starred on one map.

* * * *

Circular No. 724 of the U. S. Department of Agriculture is "Results of Tests of Commercial Legume Inoculants in 1944." Greenhouse tests were made by the Bureau of Plant Industry on 143 soybean samples with inoculants under 35 different brand names. Varieties used in the tests were Biloxi, Laredo, Tokyo and Virginia field soybeans; and Giant Green, Sousei, and P. I. No. 81044 edibles.

* * * *

*Because of the shortage of labor arrangements were made for German war prisoners from the prison camp at Algona, Iowa, to pour the concrete for the second unit of nine storage bins at the General Mills soybean processing plant at Belmond. The prisoners worked in three shifts of 35 men each and were transported back and forth by bus. They brought their own lunches.*

* * * *

Col. Charles A. Selby, treasurer of The Nicholson Co., Inc., of New York City, a member of the General Staff Corps, Pacific Ocean Areas, has been awarded the Bronze Star Medal for meritorious achievement in connection with military operations against the enemy on Kwajalein Island and Eniwetok Atoll, Marshall Islands Group.

* * * *

The question of types of soy flour available to bakers, the use of each type in various bakery items, a table of the composition of each type and a few formulas for bakery products in which soy flours are used are all covered in Bulletin 130 of the American Society of Bakery Engineers, prepared by Ralph M. Bohn, Archer-Daniels-Midland Co., Minneapolis. A copy of this valuable bulletin can be obtained on request to the secretary, Victor E. Marx, 1541 Birchwood Ave., Chicago 26, Ill., if a 3c stamped addressed envelope is enclosed.

* * * *

*A. A. Levinson, industrial consultant until recently general sales manager for the Glidden Co., was principal speaker for the Midwest section of the American Association of Cereal Chemists. Mr. Levinson believes that the soybean industry still has some difficulty to overcome in convincing the public of the nutritional value of its products.*

* * * *

A three-page bulletin, No. 131, entitled, "The Use of Soy Flour in the Baking Industry" by L. G. Trempel, of the A. E. Staley Mfg. Co., Decatur, Ill., has been released by the American Society of Bakery Engineers to its membership. This bulletin covers the general description of soy flours, their composition and uses. There is included a description of the use of soy flour in pie dough, sweet dough, cake, cookies, bread and pan grease. A copy of this bulletin will be sent on request to the secretary, Victor E. Marx, 1541 Birchwood Ave., Chicago 26, Ill., if a 3c stamped addressed envelope is enclosed.

* * * *

Excavation has started for the construction of a soybean plant and elevator in Mexico, Mo., for the Missouri Farmers Association, with priorities having been granted by the WPB. The soybean plant will crush about 500,000 bushels annually, and storage will hold about 275,000 bushels. The plant, which will be built by a local construction company, replaces the mill owned by the MFA, but never placed in operation, which burned more than a year ago.

* * * *

The Delphos (Ohio) Grain and Milling Co. is operating its modern soybean processing plant after almost a year of preparation which included the complete remodeling of the company building. Floyd Hiegel is manager. Capacity is 2,000 bushels of soybeans daily.

* * * *

Wm. A. Albrecht, chairman of the department of soils at the University of Missouri, is to leave about July 15 to teach in the Army University in France for some months. Dr. Albrecht will be on the faculty to teach boys of university grade in the army of occupation.

* * * *

Into the discussion of the relative nutritional merits of soy flour and skimmilk solids in bread enrichment comes the report of Harris, Clark and Lockhart (*Arch. Biochem.* 4, 243-7) that when rats were fed diets containing various proportions of milk solids and soy flours, maximum growth as reflected in weight gains was shown by animals receiving bread containing 3 percent skimmilk solids and 3 percent full fat soy flour.

## ALLIED MILLS PRESIDENT DIES

John B. De Haven, president of Allied Mills, Inc., died June 25 of a heart attack at a hospital in Highland Park, Ill., where he had been hospitalized for a rest. He was 62 years old.

Mr. De Haven was one of the country's best known feed manufacturers, and had been with Allied Mills and its predecessors for 42 years. Since the death of H. G. Atwood four years ago he had been president of the firm. Prior to that time he was executive vice president. He served as chairman of the board of the American Feed Manufacturers Association for three terms from June, 1940, to June, 1943.

—s b d—

## RECOMMENDS VARIETIES FOR THE MIDWEST

Soybean variety posters published by Ohio State College of Agriculture, University of Illinois and Purdue University Extension Service in cooperation with Central Soya Co., Inc., are now being distributed in Ohio, Indiana and Illinois, J. W. Calland, director of agronomic research for Central Soya, announces.

Variety recommendations for 1946 for the different sections of each state are carried on the posters, about 18,000 of which are being distributed.

In Ohio distribution is largely through county agents' offices, aided by vocational agriculture teachers and certified seed growers. Indiana will distribute by mail to elevators and grain dealers, seed growers' associations, county agents, vocational agriculture teachers, Triple-A offices and farm bureau cooperatives. In Illinois distribution will be largely through farm advisers.

Ohio limits recommended varieties to Earlyana, Richland and Lincoln, which can be done readily because 90 percent of the state's production comes from about 40 counties in the northwestern section where Lincoln can replace all of the present midseason varieties.

Indiana has dropped its old favorites, Dunfield and Mandell, with other midseason

varieties to be replaced with Lincoln. The later varieties, Chief, Gibson and Patoka, are retained for the southern parts of the state.

Illinois still clings to Illini, which constitutes a large share of the state's acreage, in its midseason recommendations along with Lincoln. For the late varieties, Chief, Patoka and Mt. Carmel, which is more popular than Gibson in Illinois, are recommended.

"It would seem that recommending only a few top varieties in each state should insure adequate supplies of quality seed and certainly better beans for processing," states Calland. "Some of the notoriously low oil varieties that have been recommended in the past have been a serious handicap to the soybean industry.

"We feel that getting out these posters is a step toward closer cooperation between the processor and the splendid men connected with the state universities, experiment stations, and extension departments, who are working with the grower on the problems connected with the production of the soybean crop. Naturally our feed salesmen, soybean buyers, and others of our company will give full assistance to see that these posters are given wide distribution."

—s b d—

The Chicago Board of Trade has issued its 1944 volume of statistics, containing reports on grain securities, live stock, crops and prices for that year. It is bound to conform with previous annual reports published in book form by the Exchange and contains in full a record of the year's business, its officers, rules and regulations of interest and importance to the grain trade and much other valuable information.

**Officials of McMillen Feed Mills, Ft. Wayne, announce that J. B. McCorkle, of Columbus, Ohio, has been named head of the newly created calf feed department. Mr. McCorkle will have charge of sales, distribution and research. He has been in charge of beef herds at Ohio State University for the past eight years.**

# Soy Bean Processing Plants
## Regardless of Size
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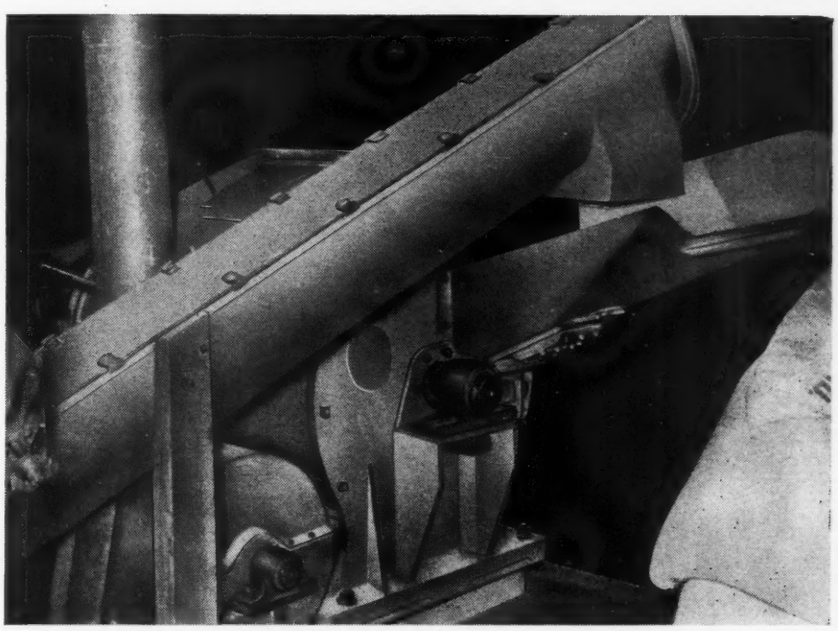
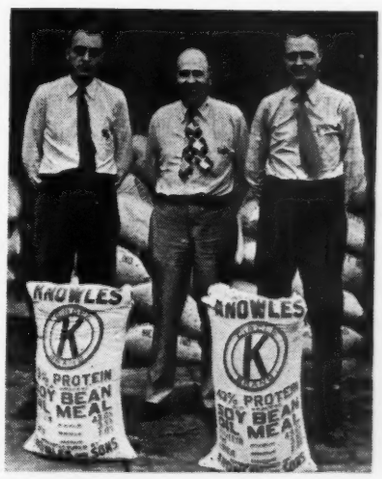


KNOWLES & SONS, Mellot, Indiana, is one of the moderate sized plants that has been outstandingly successful in the processing of Soybeans.

This firm called on Prater Service for engineering aid in laying out their plant to secure the most efficient operation for meal grinding.

A Prater Pulverizer is the central unit in the meal grinding section and the entire layout is arranged for present efficiency and future expansion. Shown at right are Messrs. Milford and Reed L. Knowles, the operators.




*Regardless of the size of your plant or the nature of your problem Prater Service is equipped to handle it.*

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## ★ RESEARCH ★

DIGESTIBILITY AND BIOLOGICAL VALUE OF SOY PROTEIN IN WHOLE SOYBEANS, SOY FLOUR AND SOY MILK, by William M. Cahill, Lawrence J. Schroeder and Arthur H. Smith, department of physiological chemistry, Wayne University College of Medicine, Detroit. Published in *Journal of Nutrition*, Vol. 28, No. 3.

Soybeans are exceptionally rich in protein and it is of considerable practical importance to have as much information as possible on the nutritive qualities of soy protein.

Experiments with animals have indicated that the protein of whole soybeans, after an appropriate heat treatment, is superior to the proteins of other legumes in its growth-promoting properties. Experiments with human beings are also desirable.

The research was undertaken to study the digestibility and the biological value of soy protein in adult human subjects. The products examined were whole soybeans, soy flour and soy milk, in comparison with egg protein.

The experimental subjects were all males from the medical school staff and student body. Experiments were carried out with three separate diet squads.

The subjects ate all their meals in one of the departmental laboratories which served both as dining room and kitchen. During a preliminary interval the individuals were fed a standard egg diet. After the preliminary interval, the first soybean product period began. This was followed by egg and soya product periods, so spaced that a soya product period was always adjacent to an egg period. All of the experimental periods were six days in length.

The subjects remained in good health throughout the study and changes in body weight were only moderate.

Results obtained indicate that the average biological values of the three soya products are not widely dissimilar, being 94.5 percent for the protein in cooked whole soybeans, 91.7 percent for cooked soy flour, and 95.3 percent for soy milk (based on a rating of 100 percent for egg protein.)

The comparatively high biological value of soy protein as determined in the studies with human subjects is in accord with the results of investigations with animals which have given evidence of the good nutritional qualities of this protein. Not only is suitably prepared soy protein capable, as the sole source of protein in the diet, of supporting good growth in experimental animals, but soy flour supplements greatly improve the nutritive value of patent flour.

---

THE IMPORTANCE OF COMMERCIAL PROCESSING FOR THE PROTEIN VALUE OF FOOD PRODUCTS. Studies with Soybean, Coconut and Sunflower Seed, by H. H. Mitchell, T. S. Hamilton, and J. R. Beadles, with the technical assistance of Frank Simpson, division of animal nutrition, University of Illinois. Published in the *Journal of Nutrition*, Vol 29, No. 1.

The sensitivity of cereal proteins to heat has been known for some time, but the subject has come into prominence recently in connection with the effect of the extreme heat, applied for only a short time, in the explosion process of preparing certain cereal breakfast foods. Evidently the preparation of these breakfast cereals yields products whose protein value in nutrition bears little if any relation to that of the raw cereals from which they were derived.

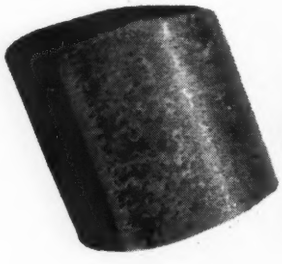
The Illinois workers measured the effect of autoclaving raw soybean oil meal and of exploding and partially exploding raw soy flour on the biological value and digestibility of their proteins.

It was found that autoclaving raw soybean oil meal increased the digestibility of the nitrogen by some 5 percentage units and the biological value by 18 percentage units. The increase was traced to an improved availability of the amino acid cystine which is contained in the soy protein.

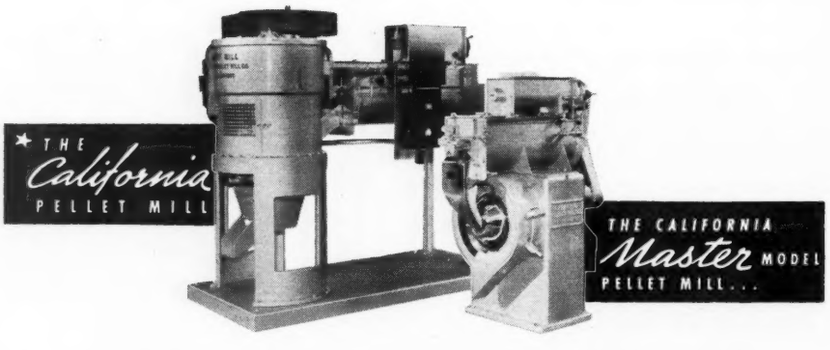
The effect of the explosion process upon the nutritive value of the protein was to increase the digestibility of raw soy flour from 84.8 to 93.4 and 95.6 and the biological value from 59.4 to 71.2 and 75.2, the differences in the processed values depending

*(Continued on page 27)*

PICTURE OF
*Efficient*
SOYBEAN FEED



Pressed or Solvent Process Soybean Feeds make available their rich nutritive values at highest efficiency as pellet feeds produced on CALIFORNIA Pellet Mills.

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**TRUCK** $9.95 in Lots of 12

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**NOW!** "Handee Andy" trucks available immediately for all purposes around plant or store—in receiving rooms, on delivery routes, between departments. Full size, first quality, not a "Junior" model, yet light weight (only 28 lbs.) A rubber tired wheel truck of this quality that you can get NOW is very unusual at these prices. 44" ht., 20" steel axle, 1" tube steel frame, 14" nose.

TERMS: 1% 10 days. Unrated firms, cash with order. Shipped F. O. B. AA-5. Priority on your order will insure immediate delivery.

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4 and 15 pound $CO_2$ (dry ice) Extinguishers

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BRAND

**EXPELLER SOYBEAN OIL MEAL**

41% Protein
4.5% Fat

either Sacked or Bulk

A Quality Product backed up by courteous service and fair dealing.

WE BUY SOYBEANS
in Car Lots or Truck Lots

**DECATUR SOY PRODUCTS CO.**

DECATUR ILLINOIS

# How to Use Spergon with Legume Inoculants On Soy Bean Seed

Repeated tests have indicated the high value of Spergon in preventing seed decay and increasing emergence, especially in a cold wet planting season.

Tests also show that Spergon is compatible with legume inoculants and that you may obtain double benefits by treating seed with Spergon and with bacterial cultures. Here's how it's done:

1. First treat seed with Spergon. The recommended rate is two ounces per bushel. Your state experiment station will advise dosages to meet special local conditions.
2. Inoculate only with strong cultures containing viable bacteria and apply excess amounts over that recommended for untreated seed.
3. Use just enough water to make culture cling to seed.
4. Plant within two hours after inoculating.

Write us for further information about the use of Spergon to increase soy bean stands and yield, and for copy of Soybean bulletin.

*Advantages of Spergon*

- Protects seed against decay caused by soil-borne and seed-surface fungi.
- Safe to use. Non-irritating and non-injurious to the operator when applying it to seed.
- Long lasting. Spergon does not deteriorate with age. May be applied months in advance of planting.
- Self-lubricating. No graphite needed in planter.

**Spergon**
*Reg. U. S. Pat. Off.*
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*Listen to "Science Looks Forward"—new series of talks by the great scientists of America — on the Philharmonic-Symphony Program. CBS network, Sunday afternoon, 3:00 to 4:30 E. W. T.*

# WASHINGTON Digest

## To Relieve Fat Shortage

The special House committee investigating food shortages recommends six steps to cope with the world-wide shortage of fats and oils, which is now putting the heaviest strain of the war on domestic production and processing. The recommendations:

(1) "It is essential that adequate transportation be made available to insure full utilization of all cottonseed for oil.

(2) "Every effort should be made for early restoration of livestock production in Europe in order to increase supplies of lard, butter and other animal fats. To make this possible it will be necessary to ship to Europe feed supplies, if available.

(3) "European production of oilseed crops should be further encouraged during the coming year.

(4) "All necessary steps should be taken immediately to procure copra from the Philippines and other Pacific areas.

(5) "To the extent that the feed situation will permit, hogs and other livestock should be fed to heavier weights.

(6) "Domestic production of oilseed crops should continue to be encouraged in 1946."

The committee gives this general view of the problem Secretary Anderson now finds himself faced with:

"The supply of fats and oils will be critically short during the remaining months of 1945 and probably most of 1946. This shortage is on a world-wide basis, and when there is a world-wide shortage it is felt heavily in the United States.

"Before the war the Far East was a net exporter of fats and oils to the extent of 3,500,000,000 pounds a year, while the United States was a net importer from this and other areas of 1,500,000,000 pounds. The cutting off of supplies from the Far East, due to the Japanese war, is the major factor causing an acute fats and oils shortage in other parts of the world.

"Although this country normally imports about 1,500,000,000 pounds of fats and oils a year net, in 1944, because of the world situation, it was called upon to export half a billion pounds net. This difference between the position of an importer and the present requirement that the United States must be an exporter explains to a large degree the cause of our shortage.

"Roughly, the United States domestic supply of edible oils in 1945 will be about 7 billion pounds, made up as follows:

| | |
|---|---|
| Cottonseed oil | 1,325,000,000 lbs. |
| Soybean oil | 1,250,000,000 " |
| Peanut oil | 125,000,000 " |
| Corn oil | 200,000,000 " |
| Lard | 2,300,000,000 lbs. |
| Butter | 1,740,000,000 " |
| Total | 6,940,000,000 " |

"However, out of this amount only about 5 billion pounds will be available to United States civilians. Eight hundred million pounds is set aside for military use and an added supply is available for military relief. About 1,300,000,000 pounds is intended for shipments to other countries. These requirements exceed supply and cause a drain from our limited reserve stocks.

"To understand what these figures mean in terms of civilian use of edible oils in the United States, this 5 billion pounds available in 1945 must be compared with 5,736,000,000 in 1944 and a prewar average of about 6,500,000,000 pounds.

"On a per capita basis this means that consumption will have declined from 48 pounds per person before the war to 45 pounds in 1944, and to perhaps 39 pounds in 1945 . . .

"On annual figures of 1945 against 1944, lard will be down 300 million pounds; shortening and oils 225 million pounds; margarine will remain about the same, but butter will decline by about 200 million pounds for civilians.

"The domestic supply has also been reduced by reason of the marked decline in hog production, a principal source of lard. This reduction amounts to 900 million pounds below the level of last year.

"The fats and oils situation in 1945 is further aggravated by the fact that the Argentine flaxseed crop, representing oils which could have relieved the pressure on certain edible oils for industrial purposes, is the lowest in 20 years, only about half of the normal level. In addition to this Argentina has — in 1944 — been burning linseed oil for fuel at the rate of 40 million bushels a year due to the inability to obtain imports of fuel oil.

"Arrangements have been made by the United States, through an agreement with Argentina, to acquire surplus supplies of vegetable oils and oilseeds for use by the United Nations and neutrals. In return, the United States is to make fuel oil available."

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## Higher Price for Soybeans?

Your new Secretary of Agriculture, Clinton P. Anderson, is a man who believes in the pull of price as an incentive to farm production, though he is in no sense an inflationist, and his aides are somewhat concerned over reports that a general rise in farm prices is probable under the new regime.

One of Secretary Anderson's principal stated aims in taking over the responsibilities of wartime farm and food management is to restore farmer confidence in government price promises.

He is also expected to make some price adjustments in commodities, such as poultry, eggs, and butter, which are either in short supply or appear to him to be out of line with the price of other commodities.

Most farm observers in Washington doubt, however, that farmers can expect more than the "creeping inflation" that already has set in — a slow, gradual rise as the Administration is forced to withdraw from one price line to another.

This is a slow process, usually affects only one commodity at a time, and could be expected to continue only until supplies again catch up with demand. Most economists here estimate that this won't occur before the fall of 1947 at the earliest, and then might not affect all crops.

Price support on soybeans grown next year will be governed largely by the need for production and the fats and oils supply situation for the 1946-47 year. Until next year's acreage goals are set, it is reasonable to assume little if any change from the present support of $2.04 a bushel.

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## Last Year's Oil Usage

Here are recent figures from the U. S. Census Bureau showing 1944 utilization of the principal vegetable oils:

For shortening, 1,182,700,000 pounds — 52 percent soybean, 41 percent cottonseed, the remainder mostly peanut, palm and coconut.

For margarine, 450,700,000 pounds — 47 percent soybean, 48 percent cottonseed.

For soaps, 197,300,000 pounds — 68 percent coconut, 10 percent palm.

For paint and varnish, 498,000,000 pounds — 77 percent linseed, 4 percent soybean, 2 percent tung.

For linoleums and oil cloth, 81,500,000 pounds — 98 percent linseed.

For printing inks, 29,100,000 pounds — 94.5 percent linseed, the remainder soybean, tung and perilla.

For candles, lamp oil, sprays, etc., 319,300,000 pounds — palm, soybean, linseed, rapeseed, coconut and corn oil.

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Estimated relief requirements for UNRRA (United Nations Relief and Rehabilitation Administration) for the first half of the fiscal year, July through December, include the following:

Edible fats and oils, 154,000 tons; oilseeds, 122,000 tons; inedible fats and oils,

**By PORTER M. HEDGE**
**Washington Correspondent for The Soybean Digest**

4,000 tons; and soap, 40,000 tons oil equivalent.

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**May Lower Flax Goal**

The first note of official optimism yet to creep into the fats and oils picture is beginning to show up in planning for 1946 flax acreage goals.

Preliminary recommendations of the U. S. D. A. committee in charge of flax goals call for 3 to 3½ million acres next year, compared with the 1945 goal of 5 million.

This goal, of course, is subject to change, and might be boosted some when the new Secretary of Agriculture sizes up the complete fats and oils picture.

The preliminary goal reflects principally improved prospects for getting more flax from Argentina, and partly the expectation of shipping some oil out of the Philippines and other South Pacific areas next year.

Materials are being sent to the Philippines to get oil and sugar producing industries back into production as rapidly as possible.

Officials expect a trickle of Pacific oils to start flowing back into the United States by next year, though in nothing like prewar volume.

The soybean goals committee hasn't yet prepared recommendations on 1946 acreage, though it is expected to have a preliminary draft of recommendations in another month.

—s b d—

## RESEARCH

*(Continued from page 24)*

upon the severity of the processing. Partial explosion produced higher values than full explosion, indicating that mild heat processing methods were to be preferred to violent ones for increasing the nutritive value of raw protein.

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WATER - SOFTENING CHARACTERISTICS OF TALLOW, SOYBEAN, COCONUT OIL, AND ROSIN SOAPS, by E. E. Ruff, Lever Bros. Co., in *Oil and Soap*, May 1945.

Sodium soaps of fatty acids derived from soybean oil are more effective as water softeners than soaps from tallow, coconut oil or of W/W gum rosin, according to an experimental study reported by Mr. Ruff.

The housewife is guided in the addition of soap to washing solutions by the development of suds. The effectiveness of a commercial soap in softening water is, therefore, of immediate interest to the consumer because most domestic waters contain a certain amount of hardness.

Sodium soybean fatty acids soap is very slightly more effective than sodium tallow soap in softening 50 p.p.m. water. This is probably not of any particular significance because both soybean oil and tallow vary somewhat in fatty acid composition.

It requires from one and one-half to about two times as much sodium coconut fatty acids soap as of sodium tallow soap to soften water of above hardness. Three to eight times as much sodium rosin soap as the tallow soap is required to soften 50 p.p.m. water.

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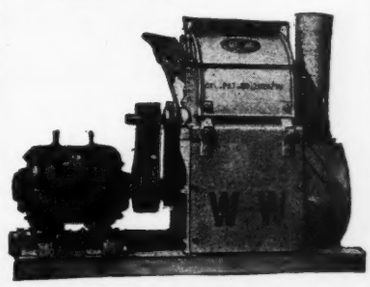

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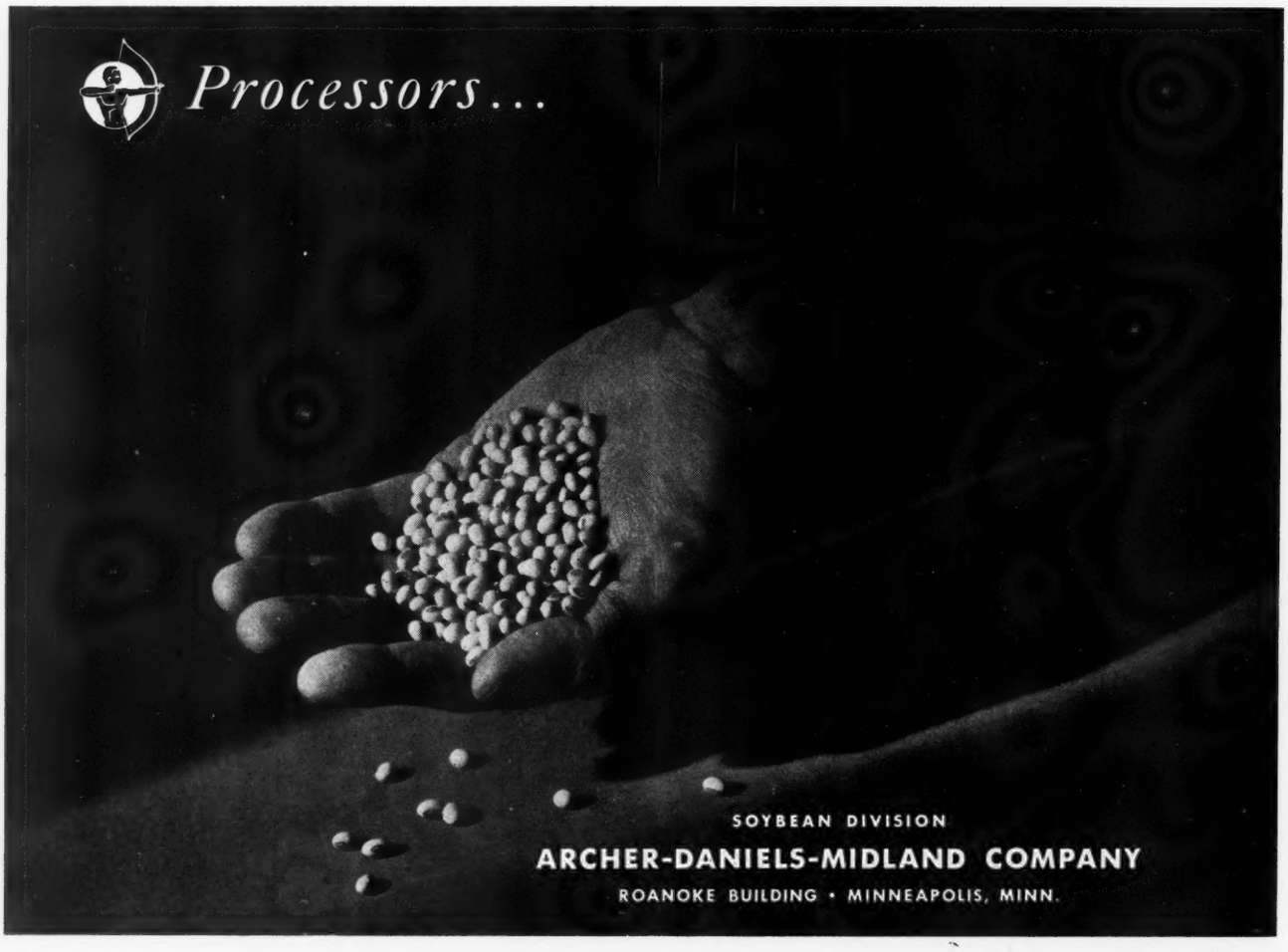
Greendale Soybean Meal



# In The MARKETS

● WFA FOOD DELIVERIES. War Food Administration deliveries of food and other agricultural commodities during May totaled 983,367,162 pounds, a decrease of 83,615,751 pounds from April deliveries.

Included in the May figure are commodities delivered for shipment to claimants under the lend-lease program, the Caribbean stockpile program, the Hawaiian program, school lunch and other domestic agencies, and the United Nations Relief and Rehabilitation Administration, and cash sales to the Red Cross, foreign relief and the armed services. Cash sales to the armed services are small, however, and most of the food acquired by the services is not included.

May deliveries for lend-lease shipment were 70 percent of the total, or 688,875,965 pounds compared with 666,646,294 pounds the previous month. Of the lend-lease deliveries, 50 percent or 342,302,164 pounds were designated for shipment to the United Kingdom and British services, compared with 321,976,677 pounds in April.

Approximately 28 percent of the lend-lease total, or 195,272,397 pounds, was for shipment to Russia. This compares with 153,750,285 pounds delivered for Russia in April. The balance of lend-lease deliveries, 151,301,404 pounds or 22 percent, was for shipment to other lend-lease claimants, including metropolitan France, French West Africa, Dominions and Colonies, the Foreign Economic Administration, Belgium, French Colonies Supply Mission, Greece and the Netherlands. During April 190,919,332 pounds were delivered to the smaller claimants.

Grain products headed the list of specific commodities delivered for lend-lease shipment, with 329,625,665 pounds or 48 percent of the total, compared with 236,306,631 pounds the previous month.

**Lend-Lease**

| Commodity (Lbs.) | May | Jan. 1, thru May 31, 1945 |
|---|---|---|
| Margarine | 4,361,219 | 26,101,002 |
| Shortening | 2,115,375 | 4,093,317 |
| Vegetable Oils | 8,894,063 | 69,082,763 |
| Soybeans | 28,351,080 | 40,520,180 |
| Soy flour and grits | 6,600,200 | 17,258,950 |
| **Hawaiian Stockpile Program** | | |
| Soybean oil meal | 2,880,000 | 7,969,800 |
| **U.N.R.R.A.** | | |
| Soy flour | 799,500 | 1,119,500 |
| **Cash Sales** | | |
| Margarine | 685,088 | 3,847,539 |
| Salad Dressing | | 18,336 |
| Shortening | 1,001,820 | 5,238,011 |
| Vegetable Oils | 188,734 | 29,287,551 |
| Soybean oil meal | | 60,000 |
| Soya Flour | 3,673,500 | 12,931,500 |
| Soya Grits | 639,500 | 927,400 |

● INSPECTIONS. Inspected receipts of soybeans continued high in May and reached a total of 5,953 cars, according to inspectors' reports to the Grain Products Branch of the War Food Administration. While somewhat less than 6,588 cars reported for the month of April, the May receipts were higher than for any other month since November 1944. Inspected receipts October through May this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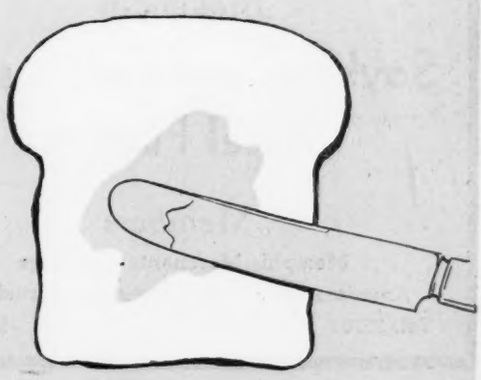

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season were 74,541 cars compared with 76,679 cars for the same period the preceding year.

The quality of the soybeans inspected in May continued good, 92 percent grading No. 2 or better compared with 91 percent in April and 88 percent in March.

Inspections of soybeans in May included the equivalent of 33 cars inspected as cargo lots, and truck receipts equivalent to about 19 cars.

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● FACTORY USE OF VEGETABLE OILS. Interesting figures from Census show the 1944 utilization of primary vegetable oils: For shortening, 1,182,700,000 lbs. (52 percent soybean, 41 percent cottonseed, rest mostly peanut, palm and coconut.) For margarine, 450,700,000 lbs. (48 percent cottonseed, 47 percent soybean oil.) For soaps, 197,300,000 lbs. (68 percent coconut oil, 10 percent palm, rest other oils.) Paint and varnish, 498,000,000 lbs. (linseed oil 77 percent, soybean oil 4 percent, tung oil 2 percent, rest divided.) Linoleums and oil cloth, 81,500,000 lbs. (98 percent linseed.) Printing inks, 29,100,000 lbs. (linseed 94.5 percent, rest soybean, tung and perilla.) Candles, lamp oil, sprays, etc., 319,300,000 lbs. (palm, soybean, linseed, rapeseed, coconut and corn oil.)

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● SOYBEAN CRUSHING. As of May, 1945, total soybean crushing capacity (excluding parttime, temporary mills) but including new construction, is estimated by USDA to be 547,518 bu. daily or about 189,440,000 bu. per year. Of these plants 67 percent use expeller or screw press equipment, 31 percent use solvent extraction and 2 percent use hydraulic presses. Leading states, mills, and percentage of each state to total capacity: Illinois, 33 mills, 35.3 percent; Iowa, 36 mills, 19.7 percent; Ohio, 17 mills, 11.6 percent; Indiana, 16 mills, 10.4 percent; Missouri, 7 mills, 3.4 percent. Proportion of U. S. soybean crop sent to crushers was about 63 percent in 1939 and nearly 73 percent in 1943.

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● SOYBEAN STOCKS. War Food Administration commercial grain stock report.

**United States Soybeans in Store and Afloat at Domestic Markets (1,000 Bu.)**

| | June 12 | June 19 | June 26 | July 3 |
|---|---|---|---|---|
| Atlantic Coast | 256 | 235 | 107 | 113 |
| Gulf Coast | 343 | 419 | 477 | 781 |
| Northwestern and Upper Lake | 401 | 131 | 246 | |
| Lower Lake | 1316 | 948 | 762 | 659 |
| East Central | 3505 | 3283 | 2922 | 2537 |
| West Central, Southwestern and Western | 2038 | 1717 | 1537 | 1311 |
| Total current week | 7859 | 6733 | 6051 | 5401 |
| Total Year ago | 6850 | 6107 | 5324 | 4682 |
| **Total North American Commercial Soybean Stocks** | | | | |
| Current week | 7859 | 6733 | 6051 | |
| Year ago | 6963 | 6218 | 5427 | 4779 |

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● STANDARD SHORTENING SHIPMENTS. By members of Institute of Shortening Mfgrs., Inc. (Pounds).

| | |
|---|---|
| June 9 | 7,875,975 |
| June 16 | 8,051,374 |
| June 23 | 7,327,083 |
| June 30 | 6,491,986 |